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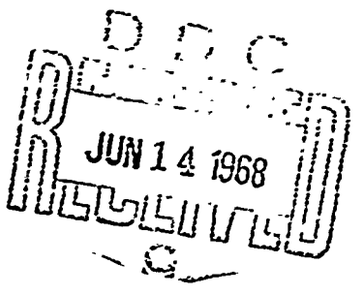

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STEM RICE BLIGHT AND SECRETS FOR ITS PREVENTION

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[Following is a translation of an article by Ono Kosaburo, Doctor of Agricultural, Science, Director First Blight and Insect Laboratory Division, Agricultural Experimental Station, Ministry of Agriculture and Forestry in the Japanese-language publication [source unknown], pp 32-34.]

Introduction

The occurrence of rice blight varies with places. At some places leaf rice blight is predominant and neck rice blight is secondary, while other places leaf rice blight is less frequent compared with the more frequent occurrence of neck rice blight. Leaf rice blight has frequently occurred in Western Japan, while there have been comparatively fewer occurrences of neck rice blight and stem rice blight. However, probably because of the changes in the cultivation methods of rice, recently the occurrence of stem rice blight in the latter half period has reached a proportion that cannot be ignored any longer.

When is Stem Rice Blight Frequent?

The occurrence of rice blight, as has been known since ancient times, varies with the weather (atmospheric temperature, sunshine, and rainfall), variety of rice, cultivation and control methods. The foremost condition for the frequent occurrence of stem rice blight is at the time when the susceptibility of the stem to rice blight is high. The points of invasion of stem blight bacteria that cause stem rice blight are stem joints, interlodes, and husks. It appears that when these sections have nitrogen the invasion of bacteria is easy and of long duration. This sort of condition

is brought about when large quantities of nitrogen fertilizer are used and the effects of nitrogen is delayed due to the low temperature during summer, or when sunshine is inadequate because of rain after the ear-appearance period. In the case of early cultivation, stem rice blight tends to occur at the times of somewhat low temperature, while in the case of late cultivation at the time of somewhat high temperatures.

The second condition is that it occurs frequently when the formation of spores of blight bacteria and their dispersion are active. This is related to atmospheric temperature and rainfall.

In Western Japan when the occurrence of leaf rice blight comes to a halt, there is a period of recess due to high temperature until the time of the occurrence of neck rice blight. However, in the case of early cultivation, the period of leaf rice blight, the period of neck rice blight, and that of stem rice blight are close together, and thus, while the activity of bacteria is continuous, ears appear. For this reason neck or stem rice blight occurs frequently.

Chemical Prevention and Control of Stem Rice Blight

When stem rice blight reaches this proportion, priority must be given to the utilization of farm chemicals for its prevention and control. To make chemical spraying effective, it is necessary to take into account the kinds of chemicals, and the timing the methods, and the frequency of spraying. The chemicals sold on the market at present may well do. However, care should be exercised so as not to make them too diluted or to use them in too small quantities.

The most problematic point is the timing of spraying. This must be decided after the investigation of the time of bacteria invasion and the time of disease occurrence. The invasion of bacteria, according to various studies, is possible at almost anytime during the period from ear-appearance to harvest. When bacteria invade the stem, symptoms of the disease are manifest in four to five days at the earliest, and in one month at the latest. However, in terms of the volume of harvest and the quality of rice, damage is great in the case of early invasion; that is, invasion soon after ear-appearance. The damage caused by the invasion of bacteria after the ear-leaning period is not too great.

Let us take a look at some test samples on the time of occurrence of stem rice blight by changing the timing of spraying mercurial preparations. Table 1 shows the spraying of chemicals in six periods during one month, from the early ear-formation period to one month after ear-appearance, and the time of bacterial invasion.

Table 1

Time of Chemical Spraying and Occurrence of Stem Rice Blight. (By Okamoto and Yamamoto, 1960)

② ⑤	① ③	④	⑥ 7
1	○	—	—
2	—	○	—
3	—	—	○
4	○	○	—
5	○	—	○
6	—	—	—

[Legend]: 1) Time of spraying Mercurial preparations; 2) section; 3) early ear-formation; 4) late ear-formation; 5) two days after ear-appearnce; 6) 11 days; 7) Occurrence rate of stem rice blight.

According to this table, the invasion of the bacteria that cause stem rice blight seems to be frequent from the early ear-formation period to the late ear-formation period, and the invasion seems to be quite often until two days after ear-appearance. The invasion seems to be much less frequent ten days after ear-appearance and on.

Table 2 shows the effectiveness of one or two chemical sprayings in the three periods of ear-formation, ear-appearance, and ear-leaning. Tests showed their effectiveness in all the three periods. The effectiveness of two sprayings was especially great.

When these test results and other tests, the relationship between the time of the invasion of bacteria and the damage, are all taken into consideration, it may be said that for the prevention and control of stem rice blight two sprayings in the ear-formation period and the ear-appearance period

Table 2

Time of Chemical Spraying and Occurrence of Stem Rice Blight

②	⑤	④	③	①			⑦
	初期	後期	2日後	1日後	2日後	3日後	⑥
1	○	○	○	○	○	○	0.9
2	—	○	○	○	○	○	1.4
3	—	—	○	○	○	○	10.1
4	—	—		○	○	○	29.7
5	—	—	—	—	○	○	27.7
6	—	—	—	—	—	○	42.5
7	—	—	—	—	—	—	31.6

[Legend]: 1) Time of spraying mercurial preparations; 2) Section; 3) Ear-formation period; 4) Ear-appearance period; 5) Ear-leaning period; 6) Occurrence of stem rice blight (per 100 ears).

are most effective. These times conveniently coincide with the best time for the prevention and control of neck rice blight and joint rice blight. The secret for spraying during the ear-formation period is in suppressing the spore formation of bacteria and letting ears appear at this time. Therefore, spraying of a large area at one time is greatly effective. This is the reason why collective prevention and helicopter spraying are regarded as being important. In the case of spraying after the ear-appearance, even individual prevention is effective.

The control of neck rice blight and stem rice blight is too late after occurrence. The preventive chemical spraying during the ear-formation period should be regarded as being important.

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